

# APPLICATION UNDER UNITED STATES PATENT LAWS

Invention: **Apparatus For Spreading Aggregate Material On A Road Berm**

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### This is a:

- ☐ [ ] Provisional Application
- ☒ [X] Regular Utility Application
- ☐ [ ] Continuing Application
- ☐ [ ] PCT Application (Chapter I)
- ☐ [ ] Design Application
- ☐ [ ] Reissue Application
- ☐ [ ] Plant Application

## **SPECIFICATION**

## **APPARATUS FOR SPREADING AGGREGATE MATERIAL ON A ROAD BERM**

**[0001]** This application is based on U.S. Provisional Application No. 60/512,775, filed on October 21, 2003 and claims the benefit thereof for priority purposes.

### **[0002] FIELD OF THE INVENTION**

**[0003]** The invention relates to an apparatus for spreading aggregate material such as stone on a berm or road shoulder, more particularly, to an apparatus that can spread the aggregate material and then be towed behind a vehicle to another location.

### **[0004] BACKGROUND OF THE INVENTION**

**[0005]** In road maintenance and road building, there is a need to spread aggregate material such as stone precisely along the shoulder or berm of the road. Typical aggregate spreaders include a hopper that receives the aggregate material from a dump truck. The spreader pushes the truck forwardly while spreading the aggregate material. Once the job is finished, the conventional spreader is typically loaded on a semi low-boy trailer to be transported to the next job, which requires the trailer, is costly, and is time consuming.

**[0006]** Accordingly, there is a need to provide an aggregate spreading apparatus that can spread aggregate at one job site under its own power while pushing a supply truck and then be towed behind a vehicle to another job site.

### **[0007] SUMMARY OF THE INVENTION**

**[0008]** An object of the present invention is to fulfill the need referred to above. In accordance with the principles of the present invention, this objective is obtained an apparatus for spreading aggregate material on ground. The apparatus includes a body, an engine carried by the body, motive structure powered by the engine to move the apparatus along the ground. A hopper is associated with the body and is constructed and arranged to receive aggregate material from a

source of aggregate material. Dispensing structure, associated with the hopper, is constructed and arranged to dispense aggregate material from the hopper to the ground. Wheel structure, carried by the body, is constructed and arranged to be movable between an inoperative position, wherein the motive structure is in a ground engaging position and the wheel structure is in a position so as not to engage the ground, and an operative position, wherein the wheel structure is in a ground engaging position and the motive structure is in a position so as not to engage the ground. A hitch structure, carried by the body, is constructed and arranged to be coupled to a vehicle so that the apparatus can be towed by the vehicle when the wheel structure is in the operative position thereof.

**[0009]      BRIEF DESCRIPTION OF THE DRAWINGS**

**[0010]**      The invention will be better understood from the following detailed description of the preferred embodiments thereof, taken in conjunction with the accompanying drawings, wherein like reference numerals refer to like parts, in which:

**[0011]**      FIG. 1 is a front view of an aggregate spreading apparatus provided in accordance with the principles of the present invention.

**[0012]**      FIG. 2 is a rear view of the apparatus of FIG. 1.

**[0013]**      FIG. 3 is a right side view of the device of FIG. 2.

**[0014]**      FIG. 4 is a left side view of the device of FIG. 2.

**[0015]      DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENT**

**[0016]**      An apparatus for spreading aggregate material, generally indicated at 10, is shown in FIGS. 1-4 in accordance with the principles of the invention. The apparatus includes a body 12 with an engine 14 carried by the body 12. The engine is preferably a diesel or gasoline fueled engine. A hydraulic system 16 is provided for supplying power from the engine 14 to the apparatus. The hydraulic

system 16 includes the conventional hydraulic motors (not visible) and tubing to hydraulically operate equipment on the apparatus 10. Motive structure, generally indicated at 17, is powered and controlled in the conventional manner by the hydraulic system 16 to move the apparatus 10 along the ground in an advancing direction B (FIG. 3). In the embodiment, the motive structure 17 is in the form of a pair of steerable driving tracks 18 disposed in spaced relation with respect to the body 12. It can be appreciated that the motive structure 17 can be driving wheels or other structure for supporting and moving the apparatus 10 along the ground.

[0017] As best shown in FIG. 1, a hopper 20 is associated with the body 12. The hopper 20 is constructed and arranged to receive aggregate material such as stone from a source of aggregate material, for example, a dump truck. At the front of the body near the hopper, push rollers 22 are provided and are used in engaging the tires of a dump truck as the apparatus 10 pushes the dump truck forwardly while spreading the stone. The push rollers 22 are preferably hydraulically adjustable towards and away from the body 12. Rolling and swiveling casters 26 are provided, preferably on a center-pivoting walking beam 45, so as to pivot therewith to maintain contact with the road while the apparatus 10 spreads stone.

[0018] Dispensing structure 24 is associated with the hopper 20 and is constructed and arranged to dispense aggregate material from the hopper 20 to the ground. In the embodiment, the dispensing structure 24 is in the form of a conveyor that receives the aggregate material from the hopper and dispenses the material to the ground (e.g., berm). The conveyor 24 is controlled by the hydraulic system 16 and is arranged to dispense aggregate material in a direction transverse with respect to the advancing direction B. A stone box or guide 25 is associated with the dispensing end of the conveyor 24 to aid in controlled dispensing of the aggregate material. In particular, stone falling from the end of the conveyor 24 is directed toward the stone box 26 that limits the extent (width) to which the stone is dispensed along the road. The stone box 26 is adjustable in the directions of arrow C (FIG.1) to control the width of stone dispensed. The conveyor 24 can be

shut-off if too much stone is delivered and can be restarted when the proper amount of stone is present. A powered roller broom 28 is provided on the body 12 for sweeping the dispensed stone from unwanted areas.

[0019] Wheel structure 30 is carried by the body 12 so as to enable the apparatus 10 to move in a towing direction A. The wheel structure 30 is constructed and arranged to be movable between an inoperative position, wherein the motive structure 17 is in a ground engaging position and the wheel structure 30 is in a position so as not to engage the ground (FIG. 2), and an operative position, wherein the wheel structure 30 is in a ground engaging position and the motive structure 17 is in a position so as not to engage the ground (FIG. 4). At least one hydraulic actuator 33 is operatively associated with the wheel structure 30 and is controlled by the hydraulic system 16 to move the wheel structure 30 about pivot 37 between the operative and inoperative positions. The wheel structure 30 includes at least a pair of wheels 31 disposed in spaced relation. In the embodiment, four wheels 31 are provided. As can be appreciated from FIGS. 3 and 4, the tracks 18 and wheels 31 are arranged such that the advancing direction B is transverse with respect to the towing direction A.

[0020] The body 12 carries a hitch structure, generally indicated at 32. The hitch structure 32 is constructed and arranged to be coupled to a vehicle 34 so that the apparatus 10 can be towed when the wheel structure 30 is in the operative position thereof (FIG. 4). In the embodiment, an arm 36 of the hitch structure 32 can be extended and retracted with respect to the body 12. The arm 36 includes a plurality of openings 39 therein for receiving a pin 41 to adjust the length of extension of the arm 36 with respect to the body 12. When the hitch structure 32 is not in use, the arm 36 can be stowed within a portion of the body 12. The arm 36 can be manually movable or moved mechanically by a hydraulic actuator or the like.

[0021] At least one lift jack 35 is provided and is hydraulically actuated to an extended position to lift the hitch end 43 of the body 12 with respect to the ground to be in a position to enable the hitch structure 32 to be attached to a towing vehicle.

Providing two lift jacks 35 is preferable to maintain balance of the apparatus 10 while being lifted. Once the hitch structure 32 is coupled with the vehicle, the actuator 33 is actuated to move the wheel structure 30 to the operative, ground engaging position and the lift jack(s) are retracted.

[0022] An operator's station, generally indicated at 38, is provided on the body 12. The operator's station 38 includes a seat 40, a steering wheel 42, and hydraulic controls 44 that are associated with the hydraulic system 16 for controlling the hydraulic equipment on the apparatus 10.

[0023] In spreading the aggregate material, the apparatus 10 is self-powered and is advanced by the motive structure 17. The apparatus 10 pushes the supply truck that fills the hopper 20, while dispensing the aggregate material. When the hitch structure 32 is extended and coupled to a vehicle and the wheel structure 30 is moved to the operative position, the apparatus 10 can be easily towed behind the vehicle to a new location. Thus, there is no need to provide a low-boy trailer to carry and move the apparatus 10 to another location.

[0024] The foregoing preferred embodiments have been shown and described for the purposes of illustrating the structural and functional principles of the present invention, as well as illustrating the methods of employing the preferred embodiments and are subject to change without departing from such principles. Therefore, this invention includes all modifications encompassed within the spirit of the following claims.